APPENDIX H
MITIGATION MEASURES, MONITORING AND REPORTING PROGRAM FOR PHASE II: SONOMA COAST TRAIL REHABILITATION & DEVELOPMENT PROJECT

MITIGATIONS

The following are mitigation measures specific to Phase II of the Sonoma Coast Trail Rehabilitation & Development Project. See Appendix D for Phase I mitigations.

I. AESTHETICS

No specific mitigation measures are required to protect aesthetics.

II. AGRICULTURE RESOURCES

No specific mitigation measures are required to protect agricultural resources.

III. AIR QUALITY

No specific mitigation measures are required to protect air quality.

IV. BIOLOGICAL RESOURCES

- a) Special Status Plants: Mitigation will consist of closure and restoration of approximately 2800 l.f. of old trails. Where feasible, native plants within the zone of impact will be relocated to abandoned trail sections. Jute netting will be laid on closed trail for seed capture and to speed the process of revegetation.

- a) Special Status Plants: Perma-Zyme treatment north of Drainage #7 will be shortened by 90 l.f. beginning directly north of the bridge thereby avoiding any impacts to *Sidalcea malviflora* sspp. Prior to the start of construction, a DPR-qualified Resource Ecologist will identify locations and instruct construction supervisors in ways to recognize and avoid the population.

- a) Special Status Wildlife: To lessen the potential for nest disturbance of northern harriers, prior to construction, a qualified State Park ecologist shall instruct the work crews on how to identify harriers and their nesting behavior. If nesting behavior is observed during any construction activity, the crews shall immediately stop work in the area of disturbance and notify a Senior or Associate State Park Resource Ecologist.

- Special Status Wildlife: Rock climbing activities on the large outcroppings

toward the northern end of the Kortum trail should be re-evaluated for the potential of this activity to preclude nesting.

- Wetlands: Areas of permanent wetland fill shall be mitigated through on-site, in kind enhancement at a 2:1 ratio. Areas of shaded wetland impacts shall be mitigated through on-site, in kind enhancement at a 1:1 ratio. Areas of construction disturbance shall be mitigated at a 1:1 ratio and shall be monitored for natural revegetation. Should these areas of construction impacts fail to meet the criteria established in the attached mitigation plan for natural revegetation, then these areas will be further enhanced through revegetation or weeding efforts by park staff. Mitigation efforts shall be monitored for a period of five years with annual reports submitted to ACOE and Sonoma County. See Table 5.

Table 5. SONOMA COAST TRAIL WETLAND IMPACTS AND PROPOSED WETLAND MITIGATION PHASE II

WETLAND COMMUNITY TYPE (Cowardin, 1979)	Palustrine Emergent			Palustrine Scrub-Shrub	
Area of Impact	**ACOE**	**CCA**		**ACOE**	**CCA**
Permanent Fill	262 sq. ft.	(383 sq. ft.)		285 sq. ft.	(285 sq. ft.)
Shaded Area	7460 sq. ft.	(12800 sq. ft.)		1964 sq. ft.	(1964 sq. ft.)
Construction	11190 sq. ft.	(19200 sq. ft.)		4974 sq. ft.	(4974 sq. ft.)
Mowed Areas	1425 sq. ft.	(1425 sq. ft.)		0 sq. ft.	(0 sq. ft.)
Proposed Mitigation Ratio					
Permanent Fill	2 to 1				
Shaded Area	1 to 1				
Construction	1 to 1				
Proposed Mitigation Method					
Permanent Fill	Creation or Enhancement				
Shaded Area	Creation or Enhancement				
Construction	Monitoring or Revegetation				
Proposed Mitigation Area	**ACOE**	**CCA**		**ACOE**	**CCA**
Permanent Fill	524 sq. ft.	(766 sq. ft.)		570 sq. ft.	(570 sq.ft.)
Shaded Area	7460 sq. ft.	(12800 sq. ft.)		1964 sq. ft.	(1964 sq. ft.)
Total Created or Enhanced Habitat	**7984 sq. ft.**	**(13566 sq. ft.)**		**2534 sq. ft.**	**(2534 sq. ft.)**
Construction	11190 sq. ft.	(19200 sq. ft.)		4974 sq. ft.	(4974 sq. ft.)

(brackets) denote wetland totals inclusive of wetlands as defined under the California Coastal Act.

Table 5. (CONTINUED)

WETLAND COMMUNITY TYPE (Cowardin, 1979)	Palustrine Forested	
Area of Impact	**ACOE**	**CCA**
Permanent Fill	32 sq. ft.	(32 sq. ft.)
Shaded Area	160 sq. ft.	(160 sq. ft.)
Construction	2040 sq. ft.	(2040 sq. ft.)
Mowed Areas	810 sq. ft.	(810 sq. ft.)
Proposed Mitigation Ratio		
Permanent Fill	2 to 1	
Shaded Area	1 to 1	
Construction	1 to 1	
Proposed Mitigation Method		
Permanent Fill	Creation or Enhancement	
Shaded Area	Creation or Enhancement	
Construction	Monitoring or Revegetation	
Proposed Mitigation Area	**ACOE**	**CCA**
Permanent Fill	64 sq. ft.	(64 sq. ft.)
Shaded Area	160 sq. ft.	(160 sq. ft.)
Total Created or Enhanced Habitat	**224 sq. ft.**	**(224 sq. ft.)**
Construction	2040 sq. ft.	(2040 sq. ft.)

(brackets) denote wetland totals inclusive of wetlands as defined under the California Coastal Act.

Palustrine Emergent

The closure of 7659 sq. ft. of trail in Palustrine Emergent wetlands will serve as partial mitigation for both US Army Corps and California Coast Commission wetlands. We propose the removal of non-native plant species along the remaining 5907 sq. ft. of trail located in this wetland community. Plants recommended for removal include, but are not limited to: *conium maculatum* (poison hemlock), *holcus lanatus* (velvet grass), *phalaris aquatica* (harding grass), *festuca arundinacea* (tall fescue), and *paspalum dilatatum*, (dallies grass).

Palustrine Scrub-Shrub

We propose removal of non-native plant species along the 2534 sq. ft. of trail located in this wetland community, Plants recommended for removal include, but are not limited to: *conium maculatum* (poison hemlock), *holcus lanatus* (velvet grass), *phalaris aquatica* (harding grass), *festuca arundinacea* (tall fescue), and *paspalum dilatatum*, (dallies grass).

Palustrine Forested Wetlands

The closure of 570 sq. ft. of trail in Palustrine Forested wetlands will serve as mitigation. Trail will be decompacted and covered with slash to aid in its revegetation.

V. CULTURAL RESOURCES

- 3. CA-SON-365/H: A new bridge is slated for Drainage #6 in Zone P. SON-365/H is a prehistoric shell midden with historic component located on both sides of the creek. The northern footing for the bridge poses a threat to the prehistoric aspect of the site, and will need to be mitigated. Mitigation will consist of relocating the new bridge approximately 100 feet upstream of the existing site, thus avoiding potential impacts to SON-365/H.

- 5. CA-SON-356 (Zone H), SON-354 (Zone K), SON-353 (Zones K/L), SON-350 (Zone Q): These four prehistoric shell middens are located alongside areas of the existing trail that are to be retained in their current condition. The project as designed does not pose a threat to these sites. However, they will be monitored during the course of the project to ensure that there is no indirect or unexpected impact.

- 6. A paleontologist shall be consulted to review all known and documented potential sites along the Sonoma Coast and to survey all trail sections where there is a known potential for paleontological resources. The trail crew shall be instructed to avoid ground disturbance or vegetation clearing in any areas where paleontological sites are found. If significant paleontological resources are identified along or adjacent to rail corridors, appropriate mitigation measures will be identified and implemented.

VI. GEOLOGY AND SOILS

Earthquake Effects

- a(i) It is difficult to mitigate against the potential surface rupture from an earthquake along the San Andreas Fault. This project involves only construction or rehabilitation of trails and the replacement of four bridges. If fault rupture occurs, affected sections of trails may need repair. The bridges do not appear to be underlain by a known fault. Appropriate seismic requirements should be followed during design and construction of the bridges.
- a(ii) Trails should be able to withstand strong seismic shaking with little or no damage. The bridges must be designed and constructed to withstand the effects of a potential earthquake with a maximum moment magnitude of 7.6 to 7.9, and a ground acceleration of 0.6 to 0.8g.
- a(iii) Portions of the trails located on the beach sands or other loose alluvial materials may be subject to liquefaction during an earthquake. Since relocation is most likely not an option, plan for potential repair of portions of the trials if liquefaction occurs. Any fills required should be properly engineered and compacted to minimize liquefaction effects.
- a(iv) To mitigate against the potential for seismically induced landslides, trails will be kept away from the edge of the coastal bluff. Trails will not be constructed across any known landslides.

Soil Erosion

- b) Trails shall be constructed such that rainfall runoff is not concentrated in

one direction, resulting in potential erosion. For the bridge sites, foundations shall be excavated by hand, resulting in fewer disturbances than if heavy equipment were used. Any stockpiled soil shall be covered in the event of rainfall to prevent runoff. During the construction of bridges and approach trails, silt fencing will be installed to prevent soil and debris from entering drainage channels and from traveling down slope out of the construction zone. Construction shall be scheduled to avoid rainy conditions, if possible.

VII. HAZARDS AND HAZARDOUS MATERIALS

No mitigation is proposed because no impact is anticipated.

VIII. HYDROLOGY AND WATER QUALITY

- Mitigation or impact avoidance measures regarding hydrologic and water quality issues will be developed through the consultation and permit process of the Regional Water Quality Control Board, Army Corps of Engineers and the County of Sonoma.

- j) Avoid the construction of permanent facilities along the coastal terraces and bluffs. This is already the case for much of the proposed project.

IX. LAND USE AND PLANNING

- Wherever possible, minimize the use of materials or techniques that may result in the development of permanent features within Sonoma Coast State Beach.

X. MINERAL RESOURCES

No specific mitigation measures are required to protect mineral resources.

XI. NOISE

- To reduce the impact of increased noise on humans, construction will be limited to daylight hours only and visitors will be informed through signing and the media that construction activities are to be expected during the three month period.

XII. PUBLIC SERVICES

No mitigation is proposed because no impact is anticipated.

XIII. RECREATION

b) Refer to the mitigation section under BIOLOGICAL ENVIRONMENT.

XIV. TRANSPORTATION/TRAFFIC

No mitigation is proposed because no impact is anticipated.

XV. UTILITIES AND SERVICE SYSTEMS

No mitigation is proposed because no impact is anticipated.